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Latest BluIce-EPICS Developments Including Collection along a Vector

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Collection of partial data sets at multiple sites on a crystal using the GM/CA CAT "mini-beam" enables structure solution for radiation-sensitive samples. This radiation damage mitigation technique, which many had done manually, is now automated and well integrated in BluIce-EPICS.

A vector is defined by centering two endpoints using standard sample controls. Additionally, four parameters define collection along the vector: distance between collection sites, frames per site, total number of sites, and overlap frames per site. During collection, the vector and collection sites are shown projected over the live video stream from the high-resolution on-axis camera. This aids both in defining the vector and in monitoring the collection progress.

Collection along a vector is also used to screen for potential collection sites. If a single frame is taken at each site with high x-ray beam attenuation, the damage will be minimal, and the diffraction quality can be determined by visually examining the diffraction images. For some crystal types, this may be preferred over the 2D rastering capability in BluIce-EPICS, since the vector is defined in arbitrary 3D space.

Other BluIce-EPICS advances in 2010 include a fully WebIce-connected Java screening tab, rastering history (multiple raster run tabs), and rastering controls synchronization between multiple instances of BluIce-EPICS.